

Development of Massachusetts Flow Standards

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Summary: My 15 Minutes

- Recent history (1999-2005)
- MA streamflow standards (targets) approach
- Stressed Basins Re-Analysis

Streamflow Standards

Recent History

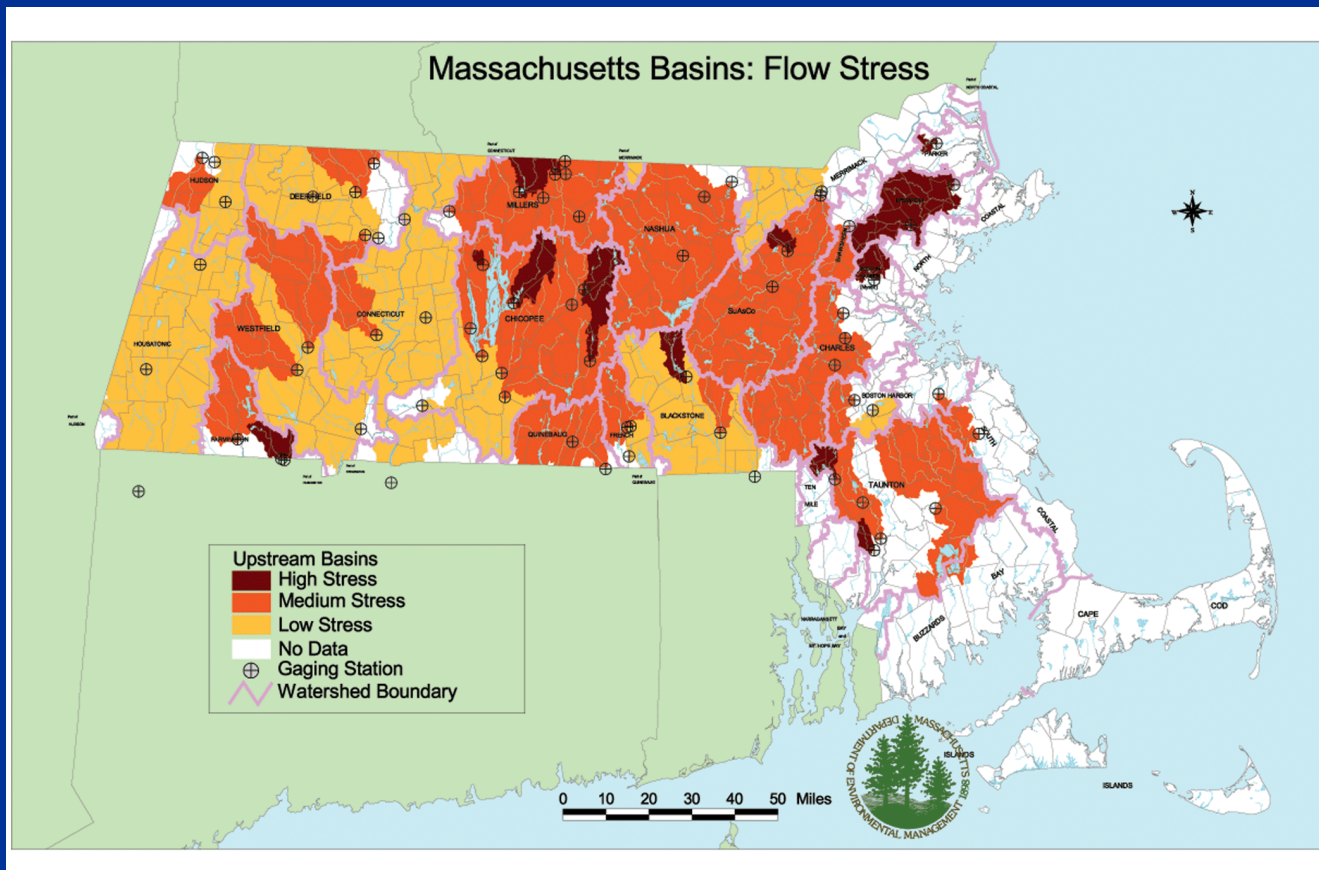
- 1999 Water Resources Commission assigns staff to identify “Stressed Basins” in Massachusetts, Approved December 2001:
 - Flow-stress only (acknowledges need to include biological indices and chemical indices, but data not available)
 - Does not identify source(s) of flow stress
 - Vicki Gartland-DEM did this work!

2001 Stressed Basins

- Ranked gage flow statistics and compared the gages to each other
- Broke data into three Stress ranges:
 - (High, Medium, and Low)
- For three Low-Flow Statistics:
 - Annual 7-Day Low Flow
 - Annual 30-day Low Flow
 - Annual Low Pulse Duration

The Commonwealth of Massachusetts WATER RESOURCES COMMISSION STRESSED BASINS IN MASSACHUSETTS *Approved December 13, 2001*

http://www.mass.gov/envir/mwrc/pdf/Massachusetts_Stressed_Basins.PDF



2001 USGS Study Evaluates Habitat and Biological Needs associated with Streamflow for Ipswich River

Assessment of Habitat, Fish Communities, and Streamflow
Requirements for Habitat Protection, Ipswich River,
Massachusetts 1998-99
WRI Report 01-4161

**2004 USGS
Statewide “Index Gage Study”
develops flow statistics, confirms
fish community at least-impacted
gages in MA**

Evaluation of Streamflow Requirements for Habitat Protection by
Comparison to Streamflow Characteristics at Index Streamflow-
Gaging Stations in Southern New England
WRI Report 03-4332

Streamflow Standards

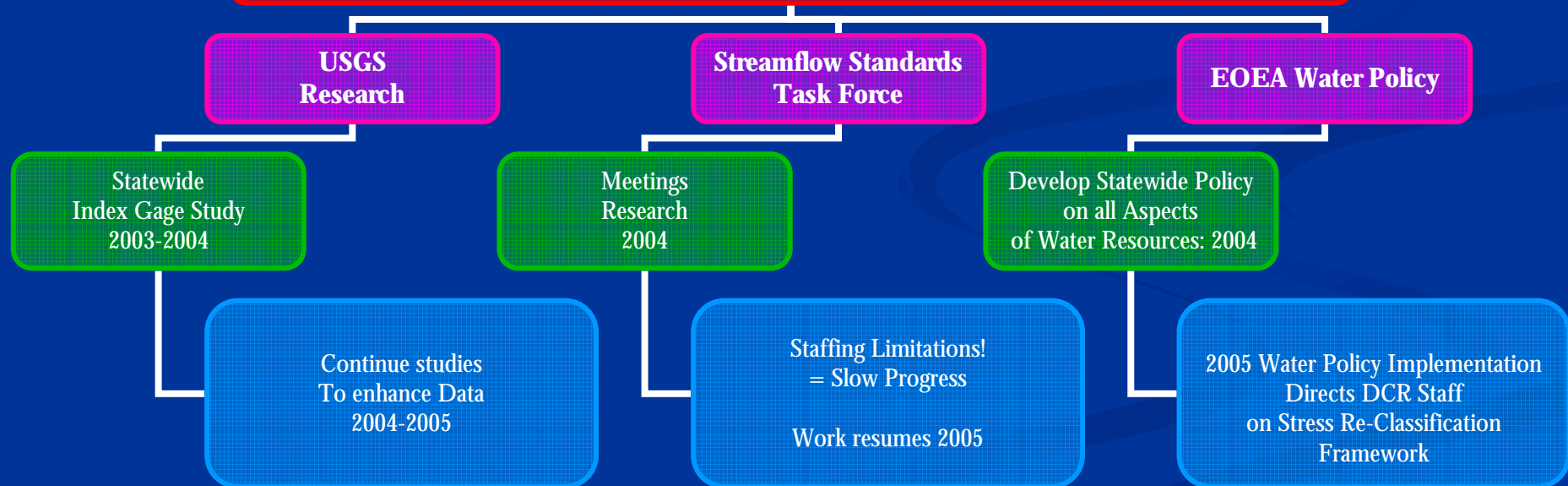
Recent History (continued)

- 2003 MA Water Resources Commission assigns staff to develop State Stream Flow Standards
 - 2004 Task Force is formed and meets January through August
 - This work is led by Vicki Gartland, who left state service in August 2004.

Streamflow Standards Flow Chart



WRC: Develop Streamflow Standards



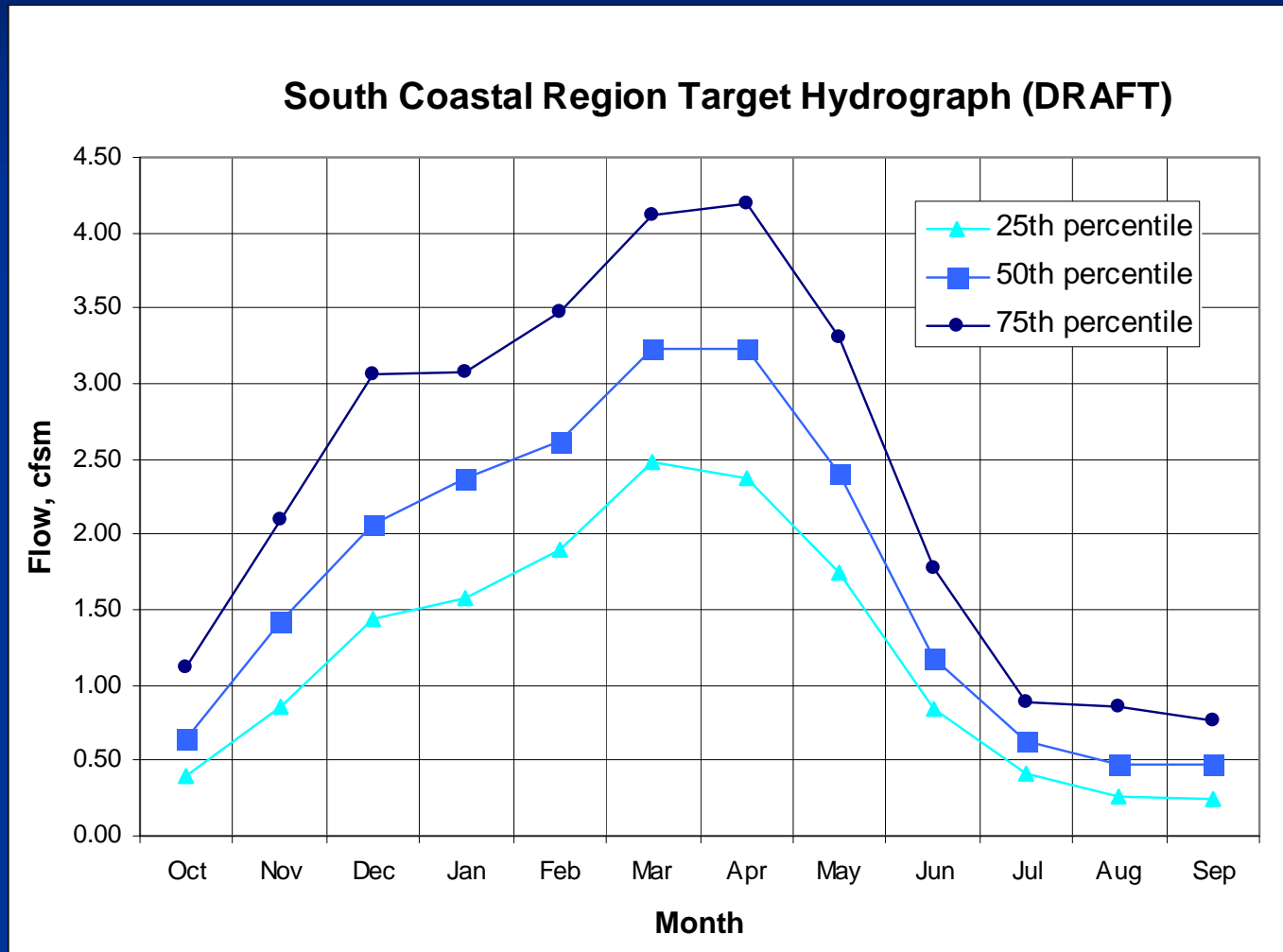
Special Notes

- The process is continuous: The research continues, DEP issues permits, regulatory decisions are made
- Many different facets of research continue (biological, chemical)

Target Hydrograph Approach

- Represent “normal” or un-impacted flow range (index gages)
- Believed to represent adequate habitat per target fish community research
- One for each Region in USGS “Index Gage” report
- Monthly median flow surrounded by 25th to 75th percentile ranges (DRAFT)
- May consider other flow statistics or “markers”
- Details very much still in the research stage!

MA Streamflow Targets Approach

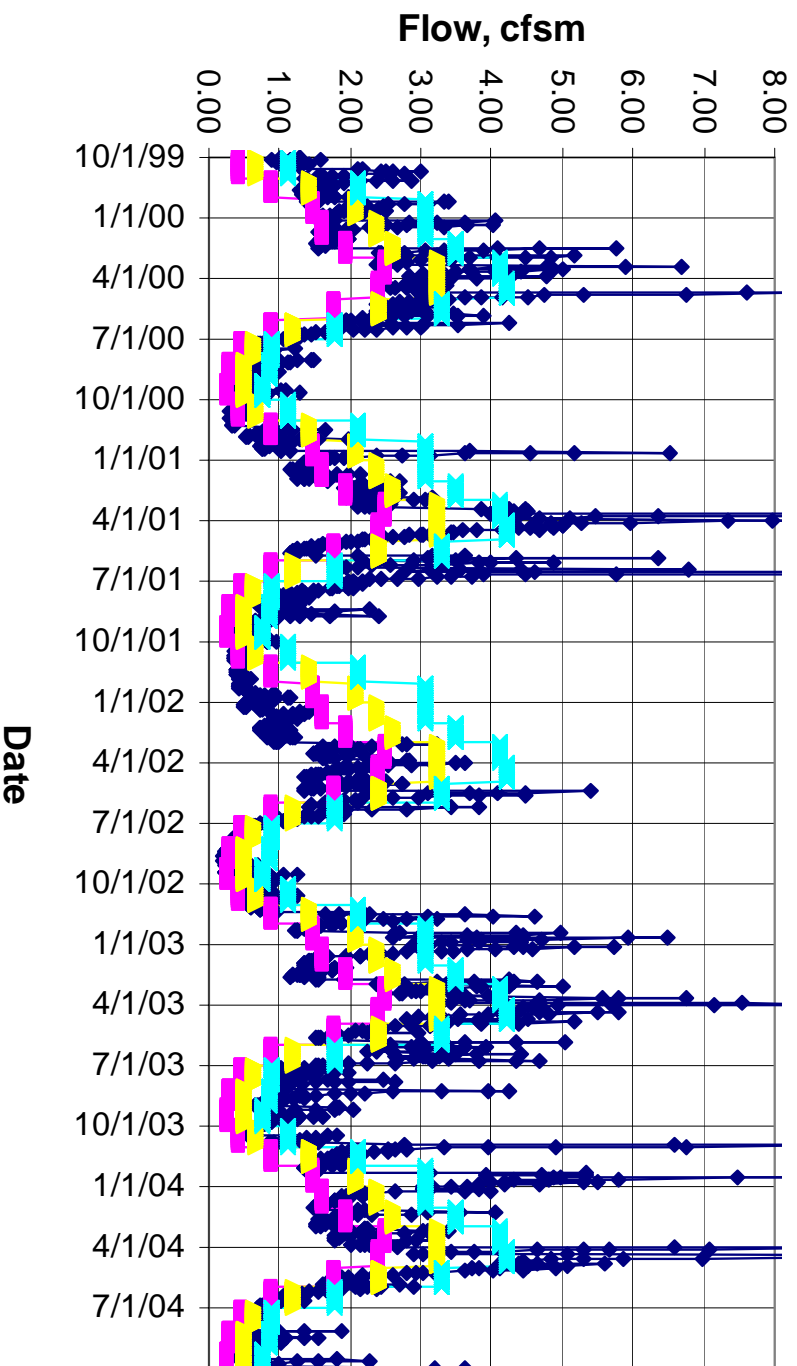


Stress Re-Analysis

- Compare Index gage statistics for a recent time period (5years) to non-index gages
- Rate the non-index gages for stress
- Will not identify causes of stress
- Will be based only on flow
- Will likely apply to the watershed area upstream of the gage
- May only require 5 years of data for analysis!
(should allow more comprehensive coverage)

Stress Analysis—Index Gages

Wood River RI WY 1999- 2004

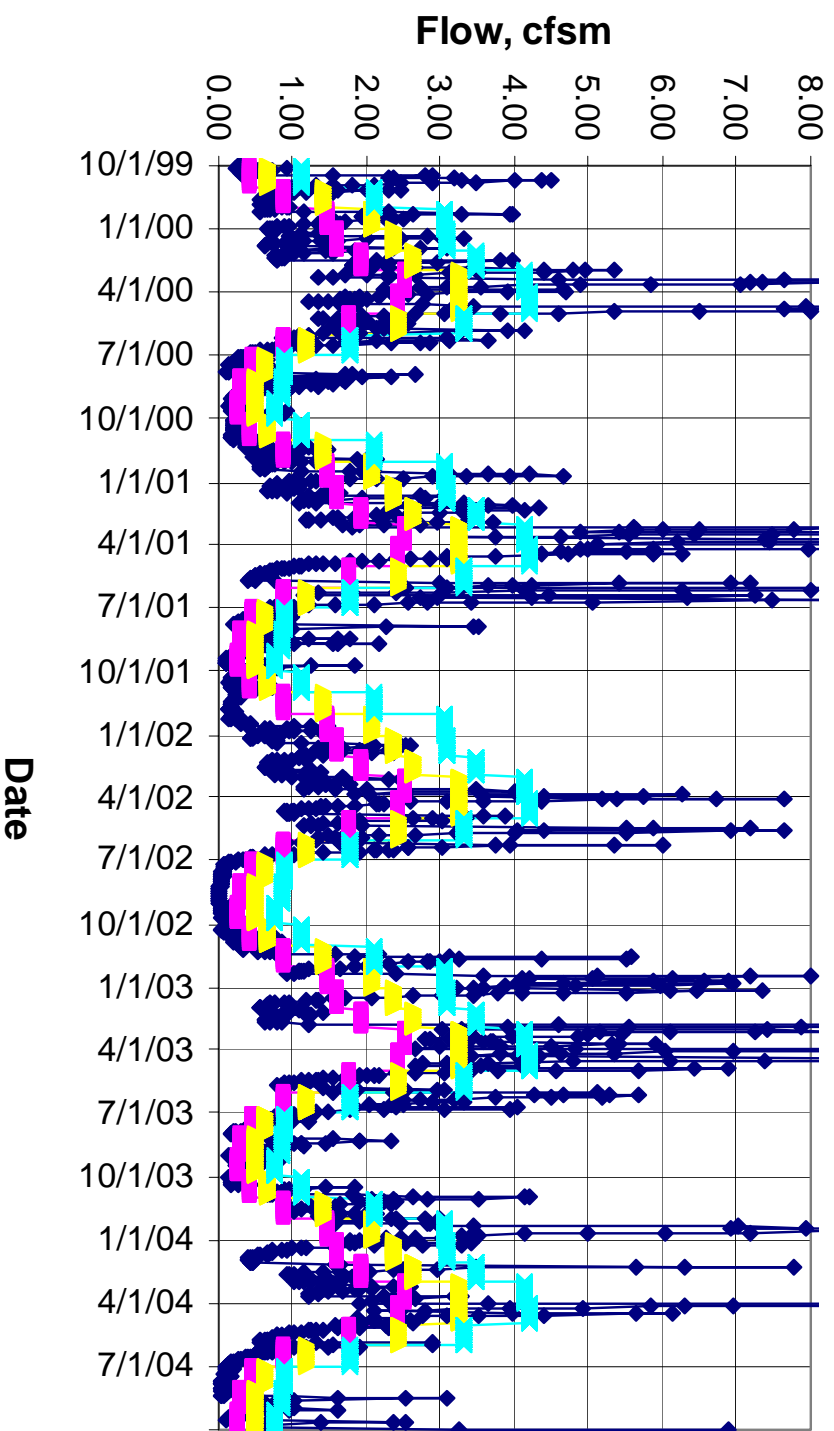


5-year analysis of Index Gage

- Period of Water Years 1999-2004
- 25% of days were below the 25th percentile
- 29% of days were above 75th percentile
- Maximum 121 continuous days below 25th percentile (11/1/01 – 3/2/02)

Stress Analysis—Non-Index Gages

Paskamanset River WY 1999- 2004

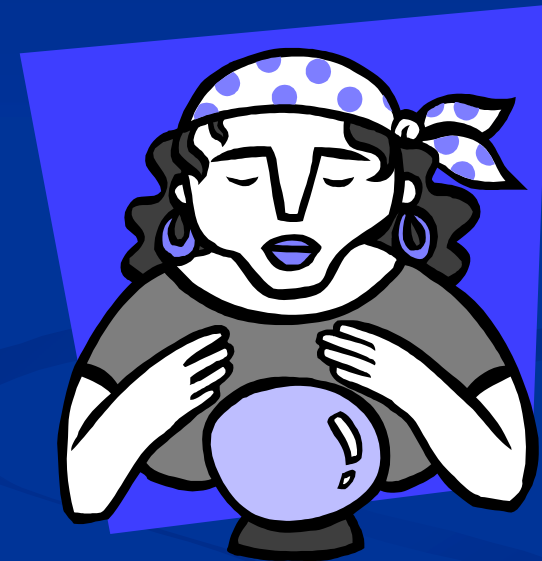


5-year analysis of Non-Index Gage

- Period of Water Years 1999-2004
- 50% of days were below the 25th percentile
- 22% of days were above 75th percentile
- Maximum 92 continuous days below 25th percentile (6/22/02-9/22/02)

The Future—Streamflow Standards

- Complete Target Streamflow Hydrographs for each region using USGS 2004 Index Gage data
- Re-convene Task Force for review
- Water Resources Commission for Approval of Streamflow Standards



The Future—Stress Reclassification

- Re-designate stress levels for all of Massachusetts
- USGS Index Gage studies continue, new data to be published 2006
- Target Fish research continues
- ⇒ Continual improvement

Massachusetts' Rivers

Thank You for your interest!

